

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 05-292693

(43)Date of publication of application : 05.11.1993

(51)Int.Cl.

H02K 3/34

H02K 3/38

(21)Application number : 04-085299

(71)Applicant : HITACHI LTD

(22)Date of filing : 07.04.1992

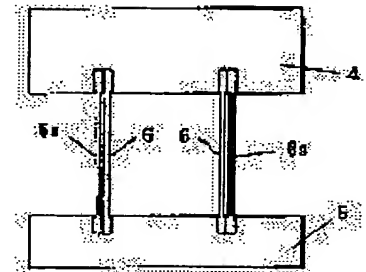
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(54) LAYER INSULATING PAPER OF MOTOR

(57)Abstract:

PURPOSE: To provide layer insulating papers, wherein their escaping problems from the slot of a stator are resolved, and the insulation between coil ends is made surer, and further, their built-in works into the slot of the stator are made easy, when the respective connection parts between the layer insulating papers are inserted into the slot of the stator.

CONSTITUTION: In layer insulating papers 4, 5 which have their cord-like connection parts 6, 6a each connection part is made to comprise a plurality of bands 6, 6a, and for the layer insulating papers subjected to a manual insertion, each connection part 6, 6a is so folded as to have a plurality of surface in the direction of the width of the band. Thereby, a practically useful effect, by which the layer insulating papers are inserted easily into the slot of a stator via its opening part when manufacturing the stator and they never escape from the slot after inserting them into the slot, is brought.



LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's]

decision of rejection]

[Date of extinction of right]

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(19) 日本国特許庁 (J P)

(12) 公開特許公報 (A)

(11) 特許出願公開番号

特開平5-292693

(43) 公開日 平成5年(1993)11月5日

(51) Int.Cl.⁵

H 0 2 K 3/34
3/38

識別記号

D 7346-5H
Z 7346-5H

庁内整理番号

F I

技術表示箇所

審査請求 未請求 請求項の数 2 (全 4 頁)

(21) 出願番号 特願平4-85299

(22) 出願日 平成4年(1992)4月7日

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最終頁に続く

(54) 【発明の名称】 電動機の相間絶縁紙

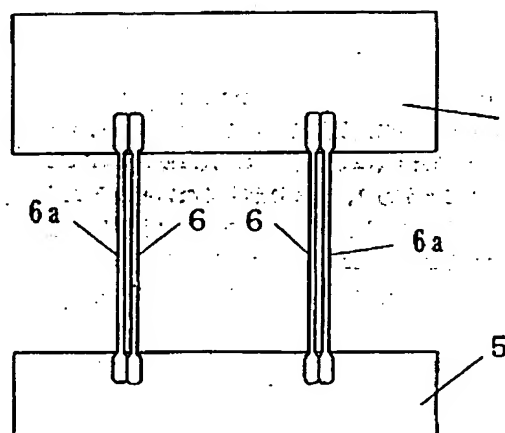
(57) 【要約】

【目的】 相間絶縁紙の各繋ぎ部をステータスロットに挿入した際、飛び出びだす問題を解決し、コイルエンド間の絶縁をより確実にすると共に組込作業を容易にする相間絶縁紙を提供する。

【構成】 紐状の繋ぎ部をもつ相間絶縁紙には各繋ぎ部を複数の帯状を設け、手挿入用相間絶縁紙には各繋ぎ部に折り曲げをいれ、帯状の幅方向に複数の面を設けた。

【効果】 ステータ製作時におけるスロット開口部からの挿入性がよく又、挿入後の抜け出しのない実用上、有益な効果がある。

図 3



【特許請求の範囲】

【請求項1】 第一の絶縁部と、第二の絶縁部と、これら両絶縁部を接続し、大きめの間隔をおいて設けられた2本以上の繋ぎ部とからなり、上記各繋ぎ部は近接した紐状であるとともに幅方向に弾性を有することを特徴とする電動機の相間絶縁紙。

【請求項2】 上記弾性を有する各繋ぎ部は、折り曲げられて帯状の幅方向に複数の面を有することを特徴とする請求項1記載の電動機の相間絶縁紙。

【発明の詳細な説明】

【0001】

【産業上の利用分野】 本発明は電動機における絶縁構成に係りコイルエンド相間の絶縁に用いられる絶縁紙の改良に関するものである。

【0002】

【従来の技術】 従来、紐状の繋ぎ部を持つ相間絶縁紙は昭59-4937に示されているように連結する繋ぎ部は、大きめの間隔をおいて単数の繋ぎ部からなっていた。又、手挿入用相間絶縁紙は昭60-31408に示されているように各繋ぎ部に折り曲げがなかった。上記に示す繋ぎ部の場合、スロット内に挿入するときの挿入性と一旦挿入してから次の工程へ移送されるうちに飛び出す恐れが考えられた。

【0003】

【発明が解決しようとする課題】 本発明はこのような各繋ぎ部の飛びだし防止を目的とした相間絶縁紙を提供することにある。

【0004】

【課題を解決するための手段】 上記目的を達成するために、紐状の繋ぎ部を持つ相間絶縁紙には各繋ぎ部を複数の紐状としたものである。

【0005】 さらに手挿入用相間絶縁紙には各繋ぎ部に折り曲げをいれ、帯状の幅方向に複数の面を設けたものである。

【0006】

【作用】 第一の絶縁部と、第二の絶縁部と、これら両絶縁部を接続するために、間隔をおいて設けられた繋ぎ部分分が、ステータ製作過程でしばしば、スロットの開口部から飛び出すことがあり、納まりが良くないという問題があった。これに対し、繋ぎ部分を複数の近接した紐状として設けるか、又は帯状としている場合はその帯状の幅方向に複数の面を有するように折り曲げることにより、これを防止することができ更には挿入作業性が向上する作用をも、得ることができる。

【0007】

【実施例】 以下、本発明の実施例を図1から図4により説明する。図5と図6は従来の例を説明する図である。

【0008】 図1は、電動機において本発明の相間絶縁紙を用いた場合の主コイルと補コイル間を絶縁した状態を表した断面図であり、1は鉄心、2aおよび2bは主

コイルで2aはコイルエンド高さが高い部分、2bはコイルエンド高さが低い部分3aおよび3bは補コイルで3aはコイルエンドの高さが高い部分、3bはコイルエンドの高さが低い部分をしめしている。4は2a、3a、両者の間に装着された大相間絶縁紙、5は2b、3b間に装置されている小相間絶縁紙で繋ぎ部6および6aによって連結されている。この相間絶縁紙が装着されている様子を展開したのが図3で4はコイルエンド高さが高い側の大絶縁紙、5はコイルエンド高さが低い側の小絶縁紙、6および6aはそれらを繋ぐ繋ぎ部である。本例では、電機固定子が単相2極の場合で、その内周をほぼ2分割した寸法の相間絶縁紙である。このように図1、図2で示されてように大相間絶縁紙4と小相間絶縁紙5は繋ぎ部6および6aによって連結されており、両者は長手方向に円をなしつつコイルエンドに添ったややラッパ状の形状となる。このため反発力によって繋ぎ部6および6aが浮き上がる事があり収納されたスロットからはみ出してしまふことがあった。このような不具合を無くするため次のような解決方法をとる。そのひとつは、両方の絶縁紙5、6の間に大きめの間隔をおいて設けた複数の近接した繋ぎ部6と6aを併設したことである。この近接の程度は、となりのスロットに入り込まない寸法であり、これによりスロット開口部から挿入するときは、6および6aはスロットの内壁面にほぼ平行に添って入り、挿入後はそれぞれが内壁面にほぼ直角に落ち着くので、スロット開口部から抜け出しにくくなる。主としてこの形状は、相間絶縁紙を自動挿入機で挿入する場合に適しておりその理由は、細やかな感覚で挿入し得ない機械の欠点をカバーする必要があるので、紐状の硬質ポリエステル樹脂等弾性に富む材質を用い2本以上で構成することにより、僅かな位置のずれや挿入力の変化に対応できるからである。これに対し手挿入用相間絶縁紙の場合は、前記形状である事は勿論問題ないが紐状繋ぎ部を溶着して製作するよりは単純な形状であるプレスによる一体打ち抜きで製作される帯状の6を有した場合が多い。この場合は、帯状の繋ぎ部6は山折りに折曲げて帯状の幅方向に複数の面を有するようにすることによりスロットに挿入後、幅方向に広がるように作用するためスロットから抜け出しにくくなる。

【0009】

【発明の効果】 本発明は、以上説明したように構成されているので以下に記載されるような効果を奏する。

【0010】 1) 繋ぎ部が紐状であり幅方向に弾性を有する2本以上の構成であるためステータ製作時にスロット開口部からの挿入性がよく又、挿入後の抜け出しがない。

【0011】 2) 繋ぎ部が折り曲げられて帯状の幅方向に複数の面を有するために前期同様の効果を奏する。

【0012】 3) 以上のような効果が総合的に働くため、作業者の習熟の度合いに左右されことなく常に安

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定した絶縁が出来、高い信頼性を有する。

【図面の簡単な説明】

【図1】本発明の相間絶縁紙の一実施例を示す電動機の断面図である。

【図2】図1の正面図である。

【図3】紐状の繋ぎ部をもつ相間絶縁紙の展開図である。

【図4】手挿入用相間絶縁の展開図である。

【図5】従来の紐状の繋ぎ部をもつ相間絶縁紙の展開図

である。

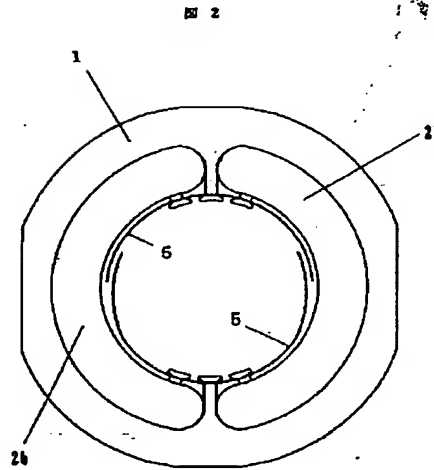
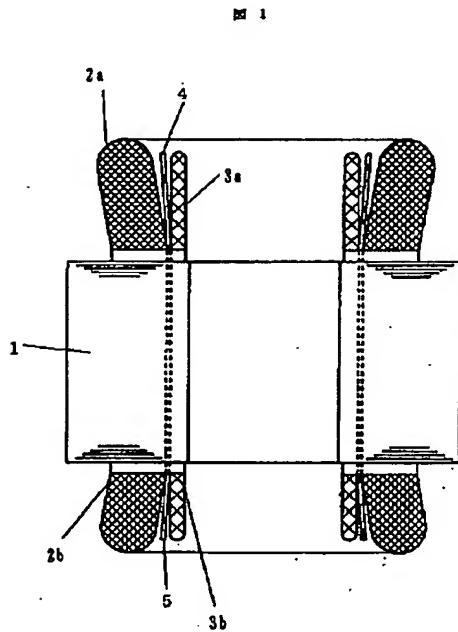
【図6】従来の手挿入用相間絶縁の展開図である。

【符号の説明】

- 1…鉄心、
- 2…主コイル、
- 3…補助コイル、
- 4…相間絶縁紙、
- 5…相間絶縁紙、
- 6…繋ぎ部。

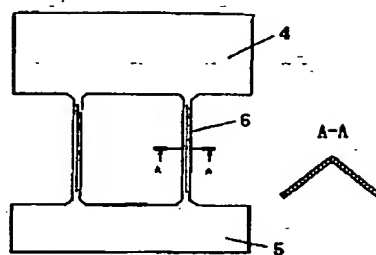
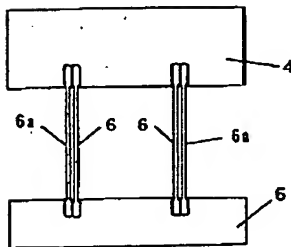
【図1】

【図2】

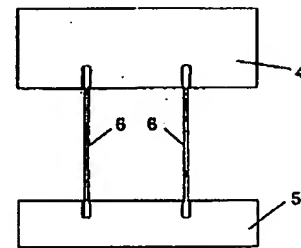


【図3】

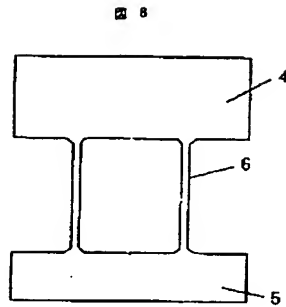
【図4】



【図5】



【図6】



フロントページの続き

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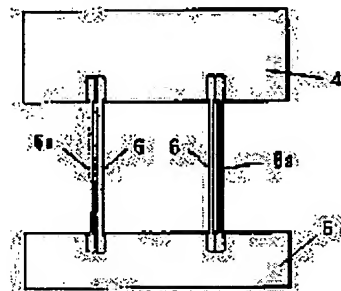
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(57)Abstract:

PURPOSE: To provide layer insulating papers, wherein their escaping problems from the slot of a stator are resolved, and the insulation between coil ends is made surer, and further, their built-in works into the slot of the stator are made easy, when the respective connection parts between the layer insulating papers are inserted into the slot of the stator.

CONSTITUTION: In layer insulating papers 4, 5 which have their cord-like connection parts 6, 6a each connection part is made to comprise a plurality of bands 6, 6a, and for the layer insulating papers subjected to a manual insertion, each connection part 6, 6a is so folded as to have a plurality of surface in the direction of the width of the band. Thereby, a practically useful effect, by which the layer insulating papers are inserted easily into the slot of a stator via its opening part when manufacturing the stator and they never escape from the slot after inserting them into the slot, is brought.



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CLAIMS

[Claim(s)]

[Claim 1] It is the interphase insulating paper of a motor which consists of the first insulating section, the second insulating section, and the two or more connector sections that connected both [these] the insulation section, set a larger gap, and were prepared, and is characterized by each above-mentioned connector section having elasticity crosswise while having the shape of a string which approached.

[Claim 2] Each connector section which has the above-mentioned elasticity is the interphase insulating paper of a motor according to claim 1 characterized by being bent and having two or more fields crosswise [band-like].

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to amelioration of the insulating paper which is applied to the insulating configuration in a motor and is used for the insulation of a coil and a interphase.

[0002]

[Description of the Prior Art] The connector section connected as the interphase insulating paper with the string-like connector section is conventionally shown in Showa 59-4937 set the larger gap, and consisted of the singular connector section. Moreover, the interphase insulating paper for manual insertion did not have bending in each connector section as shown in Showa 60-31408. In the case of the connector section shown above, a possibility of jumping out while being transported to the following production process, after ***** (ing) one time with the insertion nature when inserting into a slot was able to be considered.

[0003]

[Problem(s) to be Solved by the Invention] This invention is to offer the interphase insulating paper aiming at running-out prevention of such each connector section.

[0004]

[Means for Solving the Problem] In order to attain the above-mentioned purpose, each connector section is made into the shape of two or more string at the interphase insulating paper with the string-like connector section.

[0005] Furthermore, bending is put into the interphase insulating paper for manual insertion at each connector section, and two or more fields are prepared crosswise [band-like].

[0006]

[Function] In order to connect the first insulating section, the second insulating section, and both [these] the insulation section, there was a thing which the gap was set and was established and to which it ties and a portion often jumps out of opening of a slot in a stator manufacture process, and there was a problem that a settlement was not good. On the other hand, when preparing a connector portion as the shape of a string which plurality approached or considering as band-like, the operation whose insertion workability can prevent this and improves further can also be acquired by bending so that it may have two or more fields crosswise [the / band-like].

[0007]

[Example] Hereafter, drawing 4 explains the example of this invention from drawing 1 . Drawing 5 and drawing 6 are drawings explaining the conventional example.

[0008] Drawing 1 is a cross section showing the condition of having insulated between the main coil at the time of using the interphase insulating paper of this invention in a motor, and the ** coil. An iron core, 2a, and 2b of 1 are main coils, and, as for a coil and a portion with high height, and the portions 3a and 3b with a coil and height low [2b], in 3a, a portion with the high height of a coil end and 3b are moistening [2a] the portion with the low height of a coil end with the ** coil. The small interphase insulating paper equipped between 2b and 3b ties the large interphase insulating paper with which it was equipped with 4 between 2a, 3a, and both, and 5, and it is connected by Sections 6 and 6a. The large insulating paper of a side with a coil and height high [4], the small insulating paper of a side with a coil and height low [5], and 6 and 6a are the connector sections with which having developed signs that it was equipped with this interphase insulating paper connects them by drawing 3 . In this example, it is the interphase insulating paper of the size which divided the inner circumference into about two by the case where an electrical machinery stator is single phase 2 pole. thus, be shown by drawing 1 and drawing 2 -- while the large interphase insulating paper 4 and the small interphase insulating paper 5 are connected by the connector sections 6 and 6a for obtaining and both make a circle to a longitudinal direction -- a coil -- and it was alike and accompanied -- it becomes a trumpet-like configuration a little. For

this reason, the slot which repulsive force may tie, and Sections 6 and 6a may come floating, and was contained might be overflowed. In order to abolish such fault, the following solution methods are taken. One of them is the thing which the plurality which set and prepared the larger gap among both insulating papers 5 and 6 approached and for which it tied and Sections 6 and 6a were put side by side. Since the degree of this contiguity is a size which does not enter into the next slot, 6 and 6a accompany almost in parallel with the internal surface of a slot, and enter, when this inserts from slot opening, and each settles in an internal surface mostly at a right angle as for after insertion, it ejection-comes to be hard from slot opening. Since this configuration mainly needs to cover the defect of the machine which is suitable when inserting the interphase insulating paper by the automatic insertion machine, and cannot insert that reason with warm sensation, it is because it can respond to a gap of a slight location or change of the insertion force by constituting or more from two using the quality of the material which is rich in elasticity, such as hard string-like polyester resin. On the other hand, although it was satisfactory, of course, that it is said configuration in the case of the interphase insulating paper for manual insertion had band-like 6 really by the press which is a simple configuration manufactured by punching in many cases rather than it welds and manufactured the string-like connector section. In this case, it ejection-comes to be hard of the band-like connector section 6 from a slot in order to act by bending at a mountain chip box and making it have two or more fields crosswise [band-like] so that it may spread crosswise after inserting in a slot.

[0009]

[Effect of the Invention] Since this invention is constituted as explained above, it does so an effect which is indicated below.

[0010] 1) Since the connector section is a string-like and is the configuration of two or more which has elasticity crosswise, there is no ejection after insertion with the sufficient insertion nature from slot opening again at the time of stator manufacture.

[0011] 2) Since the connector section is bent and it has two or more fields crosswise [band-like], do the same effect so in the first half.

[0012] 3) In order that the above effects may work synthetically, the always stabilized insulation can be performed without being influenced by the degree of mastery of an operator, and it has high reliability.

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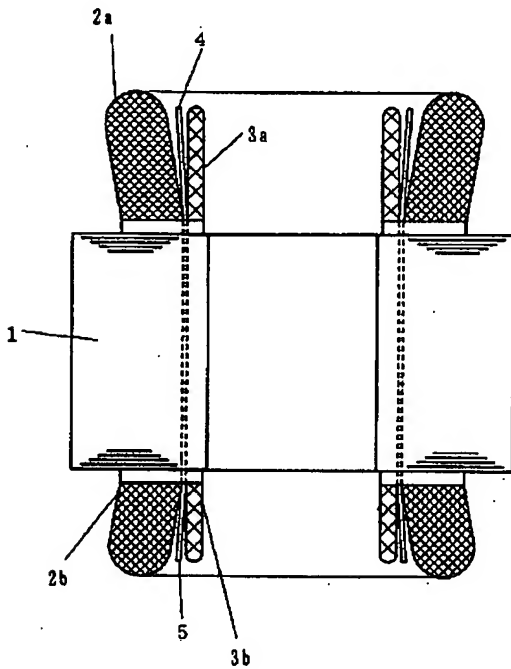
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DRAWINGS

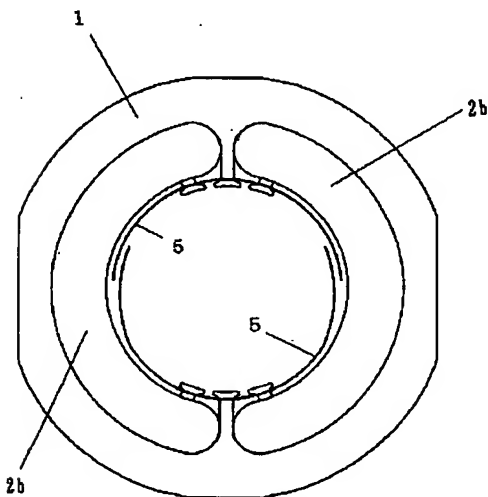
[Drawing 1]

図 1



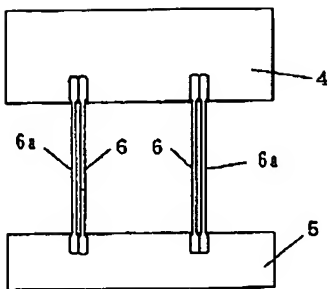
[Drawing 2]

図 2



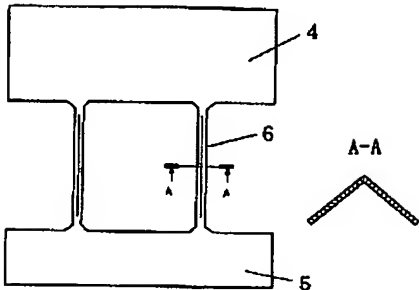
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図 3



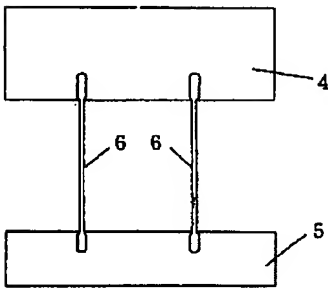
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図 4



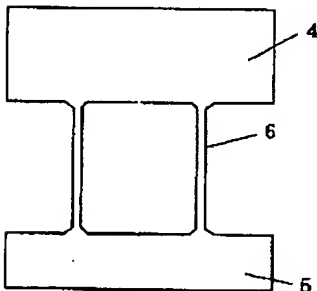
[Drawing 5]

図 5



[Drawing 6]

図 6



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